

# KF Series T & TW Ball Valves



-  Installation,
-  Operation, And
-  Maintenance

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 **G U I D E**



## Installation

Install valve in system using proper size and type mating flanges and appropriate gaskets (for RF) or seal rings (for RTJ). Valve design allows for line flow in either direction. Series T Valves are provided with a flatted diameter stem (6" bore and smaller) or a keyed stem (8" bore and larger) and four tapped holes in a machined bonnet surface for convenient actuator or gear operator mounting. Location and dimensions of these holes and stem sizes are listed on the appropriate KF Data Sheet (consult factory). KF offers an optional gear operator with handwheel which can be field mounted. Installation requires that the gear operator covers be removed for access to the mounting holes. Attachment is accomplished by socket head cap screws through the operator case and into the mating threaded holes provided in the bonnet. After attachment to valve, adjust the threaded "Open" and "Closed" travel stops by observing ball port and stem flats or key radial position. Complete assembly by installing covers.

**Series TW:** Series TW has the same installation, operation, and maintenance as Series T except the TW valve is to be welded into the pipeline with the following procedure.

**1.** Prior to welding it is imperative that all welding surfaces be cleaned from contamination such as dirt,



rust, and grease which may affect weld performance. Make sure ball is in open position.

**Caution:** During the welding process, valve body temperature should be monitored around the circumference at a location in line with the seat sealant injection fittings. The temperature at this plane should be checked with the tempil stick or other reliable temperature indicator and not allowed to exceed 300°F. This precaution is necessary to assure that non-metallic seat/seals do not suffer heat damage.

**2.** Tack weld valve into position and check for proper alignment.

**3.** Finish weld following proper weld procedure for material grade and condition, and the above caution.

**4.** If weld procedure being used requires post weld heat treatment one of the following is applicable: (A is preferred)

**A)** Localized post weld heat treatment limited to the heat affected zone does not require disassembly of the valve, and use of this method does not void the valves pressure test certifications. However, it is imperative that the valve body temperature be monitored and controlled as described in Note 1.

**B)** Post weld heat treatment of the entire body require disassembly of the valve in order to prevent damage to the valve internals. Disassembly of the valve voids warranty and test certifications.

Engineering Solutions for the World's Flow Control Industry

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## Installation, Operation, And Maintenance

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#### Operation

KF Series T Ball Valves are recommended for on-off service only. Throttling (partial opening) during flow conditions may cause excessive non-uniform wear on seats, preventing tight shut-off. All Series T Ball Valves open by rotating handle or gear operator handwheel in a counter-clockwise direction. Exact closed and open position is determined by the radial location of the stem flats or stem key with respect to the fluid bore centerline of the body. When the flats or key are perpendicular to the fluid bore, valve is closed. Positive stops and arrow indication are provided on handles and gear operators.

**Block and Bleed Operation:** KF Series T Ball Valves are well suited for sealing fluids, concurrently, at both ends. The included bleed valve (21) provides a safe and convenient method for checking closed valves seat sealing effectiveness, as required, for Block and Bleed valves.

**Caution!** *Never remove bleed valve (21) while valve is exposed to line pressure.*

#### Maintenance

KF Industries uses Val-Tex 2000 for assembly purposes. After hydro-testing, Val-Tex 2000 is injected through the Seat Injection fittings, into the seat pocket. This action assists in displacing residual test fluid left behind, assisting in good corrosion prevention. The Val-Tex 2000 is suitable for most Natural Gas, CO<sub>2</sub>, H<sub>2</sub>S, Sour Crude, water and LPG's applications. The End user is ultimately responsible for properly lubricating the valves. Please contact your Lubricant/Sealant supplier for proper media compatibility.

KF warrants their products to be free from defects in materials and/or workmanship. KF is not responsible for improper use of injection equipment, incorrect lubricants and/or sealants.

#### Reconditioning

KF Series T Ball Valves may be rebuilt to new condition without removing the valve from the pipeline.

**Caution!** *Prior to disassembly, valve must first be isolated from system pressure and flow. Also, with the valve seat at approximately half open, internal pressure must be bled to 0 psi. Finally, as a safety precaution open ball cavity bleed valve (21).*

After observing the above caution, remove retainer (17), stop plate (16) and stem bearing (15). These items are not included on 8" bore and larger valves or gear operated assemblies. On gear operated valves, remove the covers for access to mounting screws (2 each on 2" bore valves, 4 each on all others). Use an allen wrench to loosen and remove mounting screws. Segment gear position will have to be adjusted by rotating the handwheel in order to have access to all of the mounting screws. When screws are removed lift gear operator case from valve.

Rotate ball to full open position and remove cap screws (12). Using a large flat blade screwdriver, pry up and remove bonnet (2) and bonnet seal (14). Next, remove the four seat retractor screws (18) and seals (19). Screw the four retraction tools into retraction ports until contacting seats (7).

**Note:** *1) It is very important not to overstress the seats by threading the seat retraction tools in too deep. 2) If thick, very viscous grease or sealant has been injected to effect a temporary seal, body lube injection fittings (20) and internal ball checks (40) (if included) should be removed to allow sealant to extrude during seat retraction.*

Now, using two box end wrenches, screw the two seat retraction tools at one seat inward simultaneously. This action will retract the seat away from the ball.

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Watch for proper (even, not cocked) seat movement. Continue retraction of seat until approximately 1/16" clearance is obtained between seat face and port face of the ball. Now, using the two box end wrenches simultaneously, repeat the process, screwing the retraction tools in on the other seat until the 1/16" clearance for ball removal is obtained.

Remove Ball/Stem (3) by pulling up on upper stem. Be careful, observing that there is adequate clearance between ball and seats for ball/stem removal. After ball/stem is disengaged from body, release the seats by simultaneously unscrewing the seat retraction tools from each set. Reach into bonnet port and remove each seat, seat O-ring (8), seat back-up ring (9), seat sub seal (10) and wave spring (11) as a unit, by hand. Clean and inspect all parts for damage and wear. Observe seat pocket bores, stem seal bores and bonnet seal area for rust pits and scale. If necessary, use fine emery for removal of deposits on the machined surfaces. Fine emery may also be used "very lightly" on the ball sealing surfaces. Scratches or cuts on the Nylon®/Teflon® seal surfaces of the seats are cause for replacement. Flush lube and sealant injection fittings and channels with two or three pumps of general purpose grease while valve is disassembled.

Inspect trunnion bearing (4) in both the body and the bonnet. **Do Not Attempt to Remove These Bearings Unless Replacement is Required!!** If bearing removal is necessary, use a durable wide blade screwdriver or long chisel to split, then drive out bearing. Be careful not to gouge or score bearing journals.

## Reassembly

Use new replacement parts, as required. Install O-ring and back-up rings in their proper locations and orient as follows:

Stem seal back-up rings (6) belong on the side of the Stem O-ring (5) away from the ball and with the concave face toward the O-ring. The seat back-up ring (9) belongs on the side of the seat O-ring (8) closest to the ball and with the concave face toward the O-rings.

Use a liberal amount of general purpose grease on seals and machined mating surfaces. Fill the reliefs between stem O-rings with grease.

Install new trunnion bearings utilizing a wooden block and hammer to drive them into position.

Install seat assemblies and wave springs as far as possible, by hand, into seat pockets of the body. Take care to assure that O-ring seals are not pinched during assembly. Seat assembly must be placed deep enough into seat pocket so that the conical point of the seat retraction tools will contact the angled metal seat surface when they are screwed into the threaded retraction ports of the body. Using the box end wrenches, screw the two seat retraction tools inward, simultaneously.

**Note:** *It is important not to overstress the seats by threading the seat retraction tools in too deep. Therefore, after both seats are installed and mechanical retraction is begun, continue to check ball clearance so that you do not exceed approximately 1/16" space per side to provide for ball/stem installation.*

Install ball/stem between retracted seats and pilot lower stem through trunnion bearing and into stem journal. Remove seat retraction tools, allowing seats to engage with the ball surface. Next, place a new bonnet seal in the recessed diameter on body face. Install bonnet, noting proper orientation with bonnet alignment pin (22). Tighten bonnet cap screws until bonnet is made up "metal-to-metal" with face of body. Complete assembly by reinstalling retraction port screws and seals, stem bearing, stop plate and retainer or gear operator assembly.

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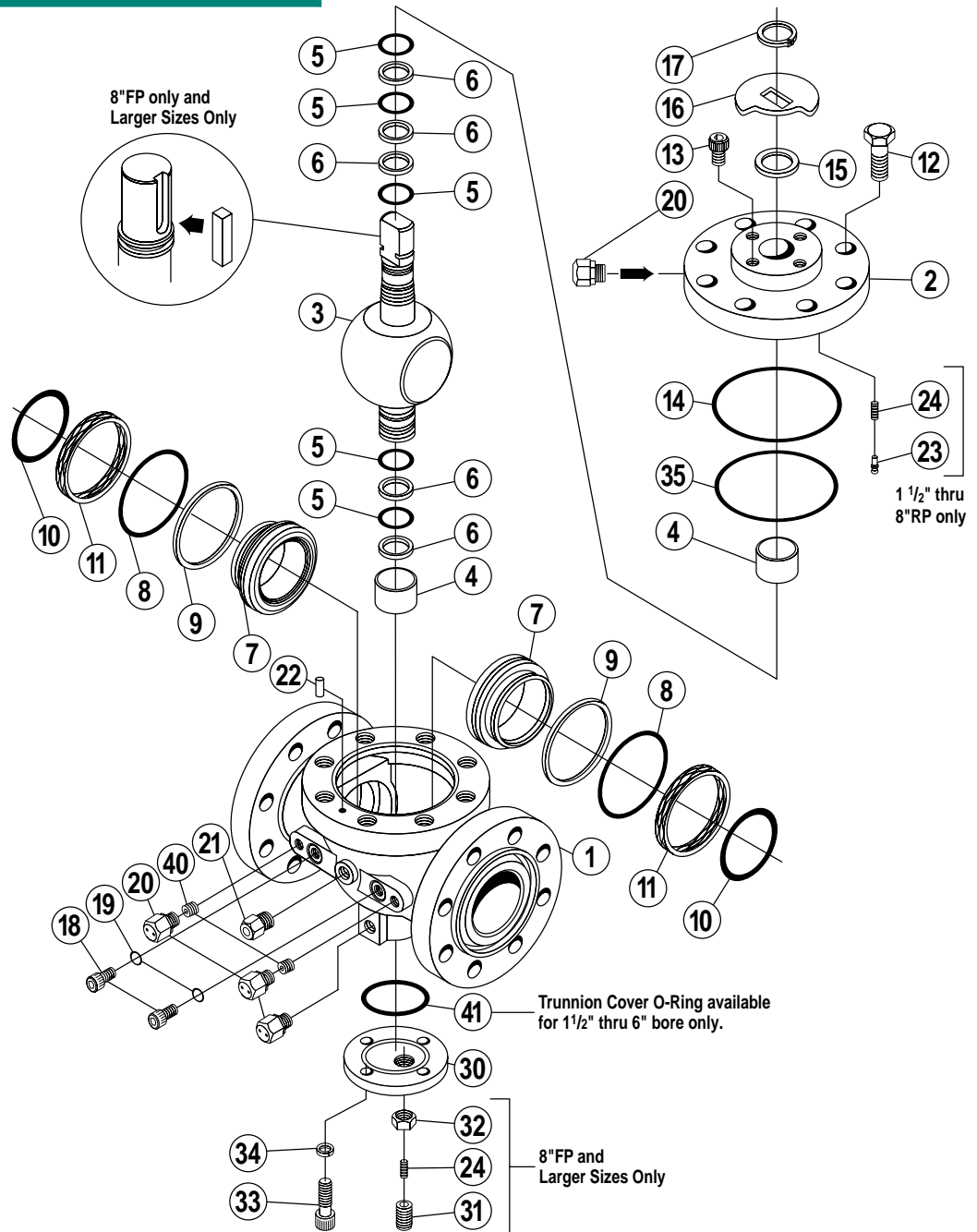


## Component Parts

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### Parts List

No.	Description
1	Body
2	Bonnet
3	Ball/Stem
4	Trunnion Bearing
5	Stem Seal
6	Stem Back-up Ring
7	Seat
8	Seat O-Ring
9	Seat Back-up Ring
10	Seat Sub Seal
11	Wave Spring
12	Bonnet Cap Screw
13*	Stop Screw
14	Bonnet Seal
15*	Stem Bearing
16*	Stop Plate
17*	Retainer
18	Retract. Port Screw
19	Retract. Port Seal
20	Injection Fitting
21	Bleed Valve
22	Bonnet Align. Pin
23*	Grounding Plunger
24	Grounding Spring
29	Key
30	Thrust Plate
31	Thrust Adjust. Screw
32	Jam Nut
33	Thrust Plate Bolt
34	Lockwasher
35	Bonnet Primary Seal
40	Internal Ball Check
41	Trunnion Cover O-Ring



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